

Please add the following new claims:

--36. A microfluidic device for the detection of a target analyte in a fluid sample comprising:

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- a) a solid support member;
 - b) a sample handling module including a sample handling well formed in said support member to receive and store said sample;
 - c) a sample inlet port to said microfluidic device;
 - d) a first microchannel formed in said support member and fluid coupled to and extending between said sample handling well and said sample inlet port;
 - e) a detection module including a detection well formed in said support member and a detection electrode positioned in said detection well, said detection electrode being provided with a self-assembled monolayer and a binding ligand; and,
 - f) a second microchannel formed in said support member and extending between said sample handling well and said detection well for the flow of said fluid sample there between.

37. The device of claim 36, and a reagent positioned in said sample handling well.

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38. The device of claim 37 wherein said reagent comprises a cell lysing agent.

39. The device of claim 36, and a filter adapted for the removal of cellular debris, said filter positioned between said sample handling well and said second microchannel.

40. The device of claim 36, and a cell capture structure provided in said sample handling well.

41. The device of claim 40 wherein said cell capture structure comprises binding moieties immobilized on the surface of beads.

42. The device of claim 36, and a cell separation structure provided in said sample handling well.

43. The device of claim 42 wherein said cell separation structure comprises an electrophoretic microchannel and electrodes.

44. The device of claim 43 wherein said cell separation structure further comprises electrophoretic gel media.

45. A device according to claim 36, and a reaction module including a reaction well formed in said support member, wherein an additional microchannel connects the reaction module to said sample handling module and a further microchannel connect the reaction module to said detection module.

46. A device according to claim 45, and reagents for nucleic acid amplification positioned in said reaction module.

47. A device according to claim 45, and an electrical resistance heater positioned in said reaction module.

48. A device according to claim 36, and an electrical resistance heater positioned in said sample handling module.

49. A device according to claim 36, and a means for inducing flow of a sample through said microfluidic device.

50. A device according to claim 48 wherein said means for inducing flow comprises a pump.

51. A device according to claim 36, and a means for holding said sample.

52. A device according to claim 50 wherein said means for holding said sample is a valve means disposed of within said microfluidic device.

53. A device according to claim 36 wherein said binding ligand is a nucleic acid.--